Topic Forum Overview, Status, and Next Steps
Leadership Council Presentation and Discussion
April 29-30, 2008

Discussion Purpose

- To familiarize the Leadership Council with the initial work of the topic forums and next steps

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Overview of Topic Forum assignment

The topic forums are the Partnership's process to help synthesize current understanding of each of the six Partnership goals and identify strategies needed for a healthy Puget Sound to advise the 2020 Action Agenda. The work of the topic forums will help answer two of the Partnership's questions: "What is the status of Puget Sound's health and what are the biggest threats to it?" and "What do we need to do to move from where we are today to a healthy Puget Sound by 2020?"

The topic forums are designed to help answer the following questions. The flow of the questions is to help make sure that our policies are based on science :

1. From a scientific perspective, what is the current, documented knowledge about this issue?
2. From a scientific perspective, what do we know about the effectiveness and certainty of management approaches aimed at addressing threats to each issue?
3. What policy approaches are currently being used to address each issue in Puget Sound?
4. Using the results from the first three questions:
   a) What principles should be used to guide strategies and actions?
   b) What work needs to be done to address the documented threats (what strategies should continue, be added, or changed)?
   c) How will we know we are making progress on each issue?

Summary of topic forum process

The topic forums are designed to engage regional scientists and policy experts. The Partnership selected six experts in their respective fields to lead each topic forum. Small teams of scientists and policy specialists are assisting the lead expert in answering specific questions related to each topic. These teams will present an initial draft paper for broader review by other experts and interests in each topic forum workshop. The will be one workshop for five of the Partnership goals and a cross-topic symposium in May to help identify common themes and needs across all topics. The quality of life work will be woven into the cross-topic synthesis work.

Leadership Council presentation
At the Leadership Council meeting, staff will give an overview of the Topic Forum process and each of the six lead consultants will give a five minute presentation of initial findings for each question, as well as ideas and feedback from workshops (some will held before the Leadership Council meets). The Leadership Council will have time to engage with the leads about what we are learning in terms of content and process.

A very short briefing paper for each topic is attached. These summaries were prepared for the Leadership Council. Leadership Council members are encouraged to read the longer versions on the website. Review questions are also included at the beginning of each paper and with the online threaded discussion.

A few notes about the discussion papers

- The draft papers are a start and do not represent an opinion or position of the Partnership. They are not complete. Our hope is that regional experts will contribute their knowledge and help build a common understanding about the problems and solutions.

- The papers are intended to be brief to identify overarching problems and solutions needed. Information from the papers will be in the action agenda. The full papers will likely be appendices to it.

- The focus of the papers is to provide documentation rather than opinion about problems and solutions.

- Papers focus on *what* the problem is and *what* solutions are needed, rather than *how* to implement specific solutions.

- Papers mainly focus on the Sound as a whole.

- Papers intentionally do not focus on the work of the cross-discipline working groups, e.g. education/outreach, funding, adaptive management.

- The individual papers will contribute to a synthesis paper that will describe the links between the individual topic areas.

Next steps in the topic forum process
Comments on the initial topic forum work will be accepted through May 6. The topic forum leads will consider the comments and then work to prepare the cross-topic synthesis work. A cross-topic synthesis paper will be prepared and posted on May 21 or 22 in advance of the May 28 symposium. On May 29, the Ecosystem Coordination Board will discuss the synthesis work and give input to the Leadership Council. All of the initial papers and the synthesis paper will be revised by the end of June. The Partnership will organize the comments in broad categories so that commenters can see how their input was considered and used.

Human Health Topic Forum
Briefing Points for Leadership Council

1. Summary of group composition, methodology

- Members:
  - Linda Hoffman, LH Consulting (Topic Forum lead)
  - Julie Wilson, EnviroIssues (support to Linda Hoffman)
  - Denice Taylor, Suquamish Tribal representative
  - Rob Duff, Washington Department of Ecology
  - Larry Fay, King County Health Department
  - Joan Hardy, Washington Department of Health
  - Maryanne Guichard, Washington Department of Health
  - Steve Marek, Tacoma Pierce County Health Department
  - Stuart Glasoe, Washington Department of Health
  - Michael Sharar, ESA Adolfson (project consulting support)
- One meeting in person to discuss questions; two group conference calls to discuss review comments on the paper from Partnership and consultants.

2. What were the major threats identified for Human Health:

- Greatest threat is consumption of fish, shellfish, and other marine biota contaminated with toxic contaminants, pathogens and biotoxins. Threat level is significant. One third of Puget Sound commercial shellfishing areas have harvest restrictions.
- Direct contact with contaminated sediment, water and biota contaminated with chemical toxics and pathogens in the water and on the beaches represents some level of threat, but not as great as that posed by consumption of fish/shellfish (exposure is lower). Roughly 13% of monitored swimming beaches had swimming advisories in early 2008.
- Decline of food source availability is of great concern. Tribal fishing and shellfishing has been reduced due to contamination.

3. What are we currently doing to address the major threats?

- Major programs:
  - Programs which prevent or reduces the existence of threats through source controls or reductions(e.g. chemical spill response regulations and local development requirements for erosion control and on-site stormwater management)
  - Programs that control entry of threats into the environment (prevent consumption of and/or contact with contaminants(e.g. federal and state regulations for boating waste, oil, and trash disposal in Washington and federal waters)
  - Programs that address environmental cleanup (e.g. MTCA and the Washington Sediment Management Standards)

- Which programs have documented effectiveness?
    - The most effective programs are those with longer history and more effectiveness measurement:
        - Fish consumption advisories
        - Biotoxin advisories and closures
        - Shellfish harvest area designations
        - Targeted efforts in some affected shellfish areas
        - Improvements in wastewater management systems and industrial pre-treatment programs
- Where are major program gaps?
    - Knowledge gaps include:
        - Lack of information about true use of the resource (fish and shellfish) by all users
        - Swimming beach program covers only a fraction of the Sound's beaches
        - Contribution of pathogen loading to the Sound from vessels not covered by Ecology's MOU
        - "Emerging" pathogens and biotoxins are largely uncharacterized
        - Lack of information on chemical contamination of shellfish (including crab)

4. What <u>should</u> we be doing?

- Which programs are on track?
    - Source control programs
    - Cleanup programs (Ecology's Toxics Cleanup Program)
    - Management programs such as
        - Shellfish and fish monitoring and advisory programs
        - Programs sponsored by DOH to assess beach safety and certify commercial shellfish operations
        - MOU between Ecology and larger cruise ships to require onboard sewage treatment
- Which programs need to be modified, added?
    - Existing regulations and management programs targeted at specific projects/actions, chemicals, practices and/or geographic areas that do not encompass all potential sources of similar threat or all threats; for example:
        - Not all chemicals in wastewater are monitored or addressed by NPDES permits
        - Not all contaminated sites have been cleaned up by CERCLA or MTCA
        - Many beaches are not included in existing commercial shellfish or recreational beach testing programs
    - Most of the existing programs address the threat once it is present, or at its discharge point into the Sound, rather than in a preemptive manner; for example

- Discharges of sewage to the Sound directly and from failing and older systems are not being corrected comprehensively
- Discharges of untreated and limited treatment sewage waste from smaller aquatic vessels is not addressed by an existing program

5. Criteria used to prioritize actions:

- Addresses greatest exposure threat (consumption of fish and shellfish contaminated with toxics and/or pathogens.)
- Addresses reduction of the origin of threat (source control)
- Eliminates the threat.
- Benefits populations that are disproportionately affected by exposure (e.g. frequent consumers of fish and shellfish due to cultural or economic reliance on the resource).
- Most cost effective in terms of reducing threats
- Addresses threats with the highest potential severity of endpoint.

Water Quality Topic Forum
Briefing Points for Leadership Council

1. Group composition, methodology

- Members: Wastewater, stormwater, oceanography, toxicology, geology, geomorphology, policy, regulatory, county, city (prior/cons)
  - Joan Lee, Parametrix
  - Pam Bissonnette, Bissonnette Environmental Solutions
  - Bill Moore, WA Department of Ecology
  - Dr. Derek Booth, Stillwater Consultants/University of Washington
  - Dr. Randy Shuman, King County
  - Bill Derry, CH2MHill
  - Dr. Charles Wisdom, Parametrix
  - Dr. John Ferguson, UW
  - Dr. Anne Fairbrother, Parametrix/OSU Affiliation
  - Attempts were made to include agricultural and tribal representation
- Approach
  - Three Workshops
    - Stormwater Subcommittee
    - Pathogens, Nutrients, Toxics Combined meeting
    - Participants review and comment on interactive drafts, prepared one page summaries of proposed actions, provided citations
  - Major Tensions/Challenges:
    - Water Quality (ecosystem) vs. water quality (individual pollutants/choices)
    - Footprint (urbanization/land uses/population) vs. footprint (individual choices)
    - Apparent impossibility of the charge vs. "moving the ball forward"

2. Major threats/conditions identified for Water Quality:

- Major Categories of Pollutants
  - Nutrients
  - Pathogens
  - Toxics
- Major Threats - Freshwater
  - Byproducts of urbanization/population increase
  - Stormwater as primary transport mechanism
  - Mixed findings for freshwater quality and sediments
  - PCBs and mercury in lake fish
  - Emerging contaminants: pharmaceuticals/personal care
  - Household/Transportation contamination of shallow groundwater
  - Nitrate contamination of shallow groundwater in agricultural areas
- Water Quality in Marine Waters/Nearshore
  - Evidence of impairment: 303(d) listings: fecal and low DO
  - Fish advisories
  - Closed shellfish beds (fecals): 30,000 ac
  - Hypoxia: apparent trends indicate increased occurrences
  - Nutrients: embayments at greatest risk

    - Metals: uncertain
    - EDCs: frequent in limited sampling
    - Sediment contamination: Highest PCBs in Seattle area
- Major Threats/Sources of Pollutants:
    - Marine waters
    - Stormwater
    - Wastewater and Industrial Treatment Discharges
    - On-Site Wastewater Systems (site dependent)
    - Agriculture-related fecals, pesticides, nutrients, EDCs
    - Legacy pollutants (contaminated sediments)
    - Airborne Deposition
    - Marine Traffic/Recreational Water Activities
- Gaps in Knowledge/Points of Discussion
    - Wastewater discharges are well studied and understood with the exception of emerging contaminants, sampling protocols and toxicological analyses are needed.
    - Definitive knowledge about stormwater and nonpoint source pollution remain elusive; monitoring data is variable; and linkages are unclear (aside from hydrology),
    - Within the Sound the relative contributions of the different threats are unknown
    - The causes of more frequent naturally occurring conditions (hypoxia and harmful algal blooms) are not well understood
    - The ramifications of climate change
    - Analysis of the impacts/benefits of moving to greater reuse of wastewater/stormwater
    - Analysis of the relative priority of CSO removal to other treatment needs

3. What are we currently doing to address the major threats/findings?

- Regulations
    - CWA, CERCLA, RCRA, NEPA,
    - MTCA, SEPA, GMA, Shorelines
    - CWA regulations for municipal/industrial well established
    - Implementation of CWA for stormwater still in transition (Ph I, II)
    - CERCLA, RCRA, MTCA costly, slow
    - Air and marine laws not represented
- Stormwater
    - Source control – uneven implementation, largely post-1995
    - Treatment measures – most effective for TSS removal, variable results for other contaminants; current approaches are presumptive
    - Low Impact Development
    - Illicit connections – ongoing removals reduce opportunities for ongoing acute or chronic impacts from waste or industrial process waters
    - Funding is typically local
    - NPDES permits in effect for jurisdictions >1000; 2005 stormwater manual adoption required by 2009
- Wastewater/Septics/Industrial
    - Secondary treatment has proven effective for biodegradable organics, suspended solids, and fecals; EDC and nutrient removal less studied
    - Technologies are available for increased toxic and nutrient removal

- Well sited/designed on-site systems effective for pathogen removal; generally not designed for receiving water conditions
- Industrial wastewater mostly goes to municipal systems following pretreatment
- Reuse potential exists but is currently stymied by regulatory and other challenges
- CSO compliance remains costly and driven by overflows per year rather than achievement of water quality standards

- Contaminated Sediments

- Direct Marine/Airborne
  - Need additional input
  - Marine industry growing in Puget Sound; Coast Guard has primary role
  - PS Clean Air Agency monitors air quality and issues advisories

Which programs have documented effectiveness?

- Clean Water Act and CERCLA have well established permitting processes with associated monitoring requirements depending on the nature of the permit

- The Water Environment Research Foundation has conducted important research on a variety of water quality topics and has published a variety of data on BMPS and their effectiveness.

4. What should we be doing?

Which programs are on track?

- CWA: Municipal and Industrial wastewater management

- CWA: NPDES permits transitioning address realities of current stormwater funding and knowledge base

Which programs need to be modified, added?

- Stormwater
  - A comprehensive, mutli-faceted strategy that integrates regulatory, planning and monitoring efforts
  - Existing stormwater programs do not address untreated urban areas, rooftop runoff, lack clarity, and are not coordinated with other regional planning efforts, including transportation
  - Water quality standards do not reflect the complexity of stomwater
  - Watershed area-wide permits are needed
  - The link between stormwater pollutant loads and ecological effects needs to be established
  - Investments in nonpoint source pollution controls to date have not addressed the problem
  - Numeric standards that capture the complexity and threats of stormwater components beyond those currently covered in state law
  - Standards for retrofits of stormwater systems that don't transfer pollutant loadings to groundwater
  - Regulations for non-commercial agriculture and small-scale nursery waste
- Wastewater
  - There is a need to require nutrient loading reduction in nutrient limited waters, including effective, standardized technologies for nitrogen removal from on-site systems
  - Expanded efforts to reduce emerging pollutants are needed (process, education)

    - There is a need to identify opportunities to decommission wastewater outfalls
- Contaminated Sediments
    - The role of sediment in Puget Sound health is not well understood
- Land Use
    - Focus protection on intact and high quality lands and watersheds
    - There is a need to Integrate land use and water resources planning
    - Expand land use controls in balance with private property right
- Source Control
    - Implement more comprehensive chemical management in Puget Sound
- Sound Health
    - Improve predictive capability of ecosystem function through the development and refinement of modeling tools
    - Improve understanding of the dynamics and levels of nutrients in Puget Sound
    - Create a means to provide overarching alignment of regulatory, jurisdictional and other efforts to clean up Puget Sound
    - Need for stronger regulations on chemicals allowed into the Puget Sound region (EU REACH program)

5. Principles for prioritizing actions

- Align/orchestrate with ecosystem topics and respect for private land ownership
- Focus on ecosystem function improvement
- Embrace uncertainty; employ adaptive management
- Control the known; prevent transference (reduce, reuse, recycle)
- Move quickly where certainty of effectiveness of action is high
- Resolve institutional barriers to otherwise feasible strategies
- Turn waste into resource

Freshwater Resources/Water Quantity Topic Forum
Briefing Points for Leadership Council

1. Group composition, methodology

- **Members**
  - Hal Beecher, WA Dept of Fish and Wildlife
  - Lynn Doremus, Nooksack Indian Tribe
  - Bill Graham, Jefferson County PUD#1
  - Steve Hirshey, King County Department of Natural Resources
  - Jim Miller, City of Everett
  - Carl Samuelson, WA Dept of Fish and Wildlife
  - Brian Walsh, Water Resources Program Manager, WA. Dept of Ecology
- **Approach**
  - Dally Environmental drafted initial versions of memos. Core group advised, improved, edited, revised, assembled science/data, case studies, policies.

2. Major threats identified for Freshwater Resources/Water Quantity:

- Over commitment of the resource through current withdrawals and diversions; 11 out of 19 watersheds have instream low flow levels limiting to fish survival
- Projected increases in consumptive use due to population growth: another 1.4 million people expected by 2020
- Land use practices that increase impervious surfaces, cause higher peak flows and lower low flows, reduce groundwater recharge, and result in loss of wetlands
- Altered hydrology; most of the urbanized watersheds in the Puget Sound basin have hydrology changes
- Altered weather regimes associated with climate change
- Loss of coastal groundwater supplies due to seawater intrusion

3. What are we currently doing to address the major threats?

- 3 general strategies: Flow setting, demand management and supply-side strategies
- Federal & State: salmon recovery planning and implementation
- State instream flow setting – flows as a water right
- State watershed planning
- Source exchange strategies
- Local water system planning (includes conservation programs)

Which programs have documented effectiveness?

- Very little documentation. Many programs achieve narrow focus or mandate
- Successful conservation programs
- Dam operation strategies that more closely mimic natural flow regimes (multiple programs)

- Newer insteam flow rules that reserve water for future growth that are linked to land use planning and development (long-term effectiveness tbd)

Where are major program gaps?

- All threats continue to be an issue.
- Ecosystem consideration – lack of integration between water use, land use, natural resource, stormwater and wastewater management and planning, climate change.
- Conservation: Region-wide conservation targets, programs to initiate social change in water use patterns regionally.
- Permit-exempt wells.
- Lack of flow targets for salmon and other aquatic species.
- Lack of regional summary of current and forecast future water use and water supply availability.
- Current water right allocation unknown without adjudication.
- Water enforcement programs are not effective in addressing illegal water use.

4. What should we be doing?

Which programs are on track?

- Instream flow rule making in Puget Sound watersheds – recent rules appear to link growth and water
- Streamflow restoration associated with dam operations (FERC opportunities, Tribal negotiations, ACOE flow management)
- Demand management- increased conservation, use of reclaimed water – (currently only local, not regional)
- Supply-side strategies: source exchange, ASR, water markets

Which programs need to be modified, added?

- Program that effectively integrates all ecosystem elements (water use, land use, stormwater, wastewater, species recovery and considers implications of climate change)
- Conservation at a regional level
- Metering program
- Program to address permit-exempt wells
- Coordination or integration of water quantity plans at a regional level
- Water use compliance and enforcement plans by watershed
- Address flow targets for fish as part of Salmon Recovery planning
- Complete development of basin flow protection and enhancement programs per PS Salmon Recovery Plan.

5. Suggested criteria used to prioritize actions:

- Links ecosystem elements for coordinated management
- Provides scientific basis for understanding and solving the problem/issue
- Effectiveness of the action
- Urgency of the threat being addressed (eg., population growth vs. climate change)

Species, Biodiversity, and Food Web Topic Forum
Briefing Points for Leadership Council

1. Group composition, methodology

- Members:
  - Laura Blackmore, Cascadia Consulting, Topic Forum Lead
  - Joe Gaydos, SeaDoc Society
  - Lynne Barre, NOAA
  - Sarah Gage, Washington Biodiversity Council
  - Ken Currens, NW Indian Fisheries Commission
  - Wayne Palsson, WDFW
  - Dr. Charles "Si" Simenstad, University of Washington
  - Mary Mahaffy, USFWS
- Approach
  - Cascadia drafted initial versions of papers;
  - Met with core group three times to improve/revise papers

2. Major threats identified for Species/Biodiversity:

- Habitat alteration; for example. shoreline modifications have changed the nature of one-third of all Puget Sound shorelines
- Surface/groundwater impacts and pollution – loss of water quantity, degraded water quality
- Harvest – over-harvest of some species, lack of consideration of effects of harvest on other species
- Cultured species – salmon hatcheries well studied, but effects of culture on intertidal habitats, other species not well studied
- Climate change – changes in water and air temperatures, oceanographic processes, all threaten species

3. What are we currently doing to address the major threats?

- Harvest: Treaty tribes and state agencies co-manage fish and shellfish harvests; state also regulates harvest of non-fish species. WDFW and WDNR also have established marine reserves. On land, Forest & Fish law and HCPs regulate timber harvests.
- Culture: not being comprehensively addressed.
- Climate change: not being comprehensively addressed.
- Habitat, Water Quality, Water Quantity: addressed in other topic forums

4. Which programs have documented effectiveness?

- Species plans – species with recovery plans in place more likely to be improving than species without.
- Harvest management has resulted in a decrease in the overall harvest mortality of wild Chinook salmon in Puget Sound. Proper management can prevent over-harvest of many species. Marine reserves can benefit over-exploited

stocks of low-mobility species, and have lesser benefits for high mobility species. There is greatly increased resilience to over-fishing within reserves.
- Effectiveness of culture management varies between culture practices and species. Captive breeding of members of threatened or endangered species can prevent extinctions and help with reintroductions; cultured salmon help protect human well-being.
- Prevention of invasive species works best, followed by early action to remove problematic invasive species.

5. Where are major program gaps?

- All threats inadequately addressed – continue to threaten.
- Culture not comprehensively addressed.
- Climate change.
- Harvest management rarely considers the effect of harvest on other species linked in the food web.
- Management and eradication of invasive species just getting underway with Invasive Species Council plan.
- Authority to manage species and their habitat is fragmented. Lack of ecosystem-based approach.

6. What <u>should</u> we be doing?

- Which programs are on track?
  - Species management plans
  - Improved harvest management techniques
  - Protection of species
  - Increased focus on human disturbance effects
  - Swift action to avoid introduction of invasive species
  - Multi-stakeholder groups and collaborative science programs
  - Prevention and restoration efforts, such as oil spill prevention programs

7. Which programs need to be modified, added?

- Need an ecosystem-based management approach that includes:
  - An institutional framework addressing all levels of government and a wide variety of stakeholders
  - A comprehensive approach to identifying and managing drivers of ecosystem change and threats
  - A comprehensive science program
  - A dedicated, sustainable funding source
- Nest existing programs within this approach and broaden them to address ecosystem goals. Example: harvest management should consider effects on species linked in food web.

8. Criteria used to prioritize actions?

Main criteria, with many sub-criteria within each:

- Urgency
- Effectiveness
- Steps toward ecosystem-based management approach

Quality of Life Topic Forum Leads
Briefing Points for Leadership Council

1. Summary of group composition

- Members:
  - Susan Burke, Northern Economics
  - Jan Cassin, Parametrix
  - Rich Adams, Oregon State University
  - Allison Butcher, Master Builders Association of King and Snohomish Counties
  - Michelle Connor, Cascade Land Conservancy
  - Bill Dewey, Taylor's Shellfish
  - Jaime Donatuto, Swinomish Tribe
  - Jim Fox, Recreation and Conservation Office
  - Jackie Kirn, City of Seattle
  - Steve Sakuma, Sakuma Brothers
  - Katharine Wellman, PSP Science Panel (advising as needed)
  - Jacque White, The Nature Conservancy

The Core Group is like a steering committee, providing information about tradeoffs between and among attributes to the Quality of Life topic.

2. What were the quality of life attributes that you identified

- The broad categories are taken from the MEA report, *Ecosystems and Human Well-Being*
  - Security
  - Basic material for a good life
  - Health
  - Good social relations and
  - Freedom of choice and action
- Core Group focused on Puget-Sound-centered attributes. Initial thinking includes:
  - Security
    - Safety from natural hazards (floods, storms, sea level rise, wildfire, etc)
    - Food security
  - Basic material for a good life
    - Affordable housing
    - Food, fiber, timber and related resource-based jobs
    - Adequate transportation systems
  - Health
    - Access to clean water
    - Access to healthful food
    - Access to recreation
  - Good social relations

        - Respect of cultural diversity
        - Sense of place and community
        - Environmental stewardship
    - Freedom of choice and action
        - Respect of private property rights
        - Respect of tribal rights

3. What are the major linkages between Quality of Life attributes and preliminary recommended strategies from the other topic forums?

- Linkages between the natural environment and Quality of Life take two primary forms:
    - Continued degradation of Puget Sound will pose threats to some attributes contributing to Quality of Life (e.g. resource-based jobs such as aquaculture)
    - Steps taken to improve the health of the ecosystem may threaten the quality of life of some individuals, depending on implementation methods (e.g. ordinances requiring more rigorous septic system monitoring/management may negatively impact the quality of life of others)
- There are inherent tensions and compatibilities between some quality of life attributes (e.g., the desire for open space may impact housing costs; access to shorelines may pose concerns for private property owners)

4. What are the major next steps you have identified?

- Refine the list of Quality of Life attributes for Puget Sound
- Review the topic forum papers to identify tradeoffs/implications/synergies
- Identify gaps in our understanding of the linkages between how changes in the health of the Sound affect Quality of Life attributes.
- Identify gaps in what is known about the inherent tensions between Quality of Life attributes and approaches to manage threats to ecosystem health
- Provide case studies for programs that are working to address tensions and possibly that can leverage synergies between Quality of Life attributes and resource management approaches